REMARKS

Claims 1-27 and 31-35 are pending. Claims 1, 21, 25, and 33-35 are in independent form.

In the action mailed October 31, 2007, claims 10 and 12 were identified as being allowable if placed in independent form and claims 34 and 35 were allowed. Applicant acknowledges the indication of allowable subject matter with appreciation.

Rejections under 35 U.S.C. § 102

Claim 21 was rejected under 35 U.S.C. § 102(b) as anticipated by Japanese Patent Publication No. 2002-082441 by Yoon et al. (hereinafter "Yoon").

Claim 21 relates to a method that includes forming a photoresist having a polymer backbone, a lactone bonded to the polymer backbone, and a side group bonded to the polymer backbone and switching the solubility of the photoresist in a developer by exposing the lactone under vacuum. The switching of the solubility causes the lactone to undergo a ring opening reaction upon exposure to an acid catalyst without molecules outgassing from the photoresist. The lactone includes a tertiary carbon bonded to the lactone carbonyl oxygen. The side group includes a styrene ring.

Yoon neither describes nor suggests these features. In this regard, as discussed previously, Yoon neither describes nor suggests that a chain bonded to the polymer backbone include a styrene ring, as recited in claim 21. Indeed, the present rejection of claim 21 does not contend otherwise.

Accordingly, claim 21 is not anticipated by Yoon. Applicant respectfully requests that the rejections of claim 21 and the claims dependent therefrom be withdrawn.

Rejections under 35 U.S.C. § 103

Claim 1 was rejected under 35 U.S.C. § 103(a) as obvious over Yoon and U.S. Patent No. 6,680,157 to Fednyshyn (hereinafter "Fednyshyn").

Claim 1 relates to a photoresist that includes a polymer backbone, a lactone bonded to the polymer backbone and having a tertiary carbon bonded to the lactone carbonyl oxygen, and a side chain bonded to the polymer backbone. The lactone is reactable under semiconductor processing conditions and in the presence of an acid to undergo a ring-opening reaction and form an open ring structure to switch a solubility of the photoresist in a developer without generating an organic species that can outgas in a vacuum environment. The side chain comprises a styrene ring.

The rejection of claim 1 contends that it would have been obvious for one of ordinary skill to have combined Yoon and Fednyshyn to have arrived at the recited subject matter. This contention is based on the following separate contentions:

-that the combination of Yoon and Fednyshyn would have a "reasonable expectation of achieving a pattern having reduced edge roughness;" (*See Office action mailed October 31, 2007*, page 3, para. 5)

-that the Fednyshyn reference is "solely cited" for its teaching that styrenes are common co-monomers with maelic anhydrides, acrylates, and methacrylates, but "not for its complete polymer;" (*See Office action mailed October 31, 2007*, page 6, first full paragraph)

-that the Yoon reference teaches that any common co-monomers may be included in the Yoon polymers and that methacrylates are preferred. *Id.*

These contentions allegedly support the present rejection of claim 1 as obvious under 35 U.S.C. § 103(a). *Id.*

Applicant respectfully disagrees and will address the rejections in turn. As for the combination of Yoon and Fednyshyn providing "a reasonable expectation of achieving a pattern having reduced edge roughness," this is unadulterated speculation. There is nothing in Yoon indicating that edge roughness in his polymers that have a tertiary carbon bonded to the lactone carbonyl oxygen needs to be reduced. Moreover, there is no reason to believe that Fednyshyn's monomers will have any impact on the edge roughness achieved with these polymers. This present motivation to combine thus represents pure speculation regarding both the need to reduce edge roughness and any reduction in edge roughness achieved with the combination. Applicant respectfully submits that such speculation cannot support a finding of obviousness.

The present reliance on "reduced edge roughness" as a basis for combining Yoon and Fednyshyn represents an evolution in the basis for the combining Yoon and Fednyshyn. In particular, the rejection of claim 1 under 35 U.S.C. § 103(a) set forth in the Office action mailed August 10, 2006 contended that Fednyshyn's polyhydroxystyrene would act as an "aid to reduce outgassing." *See Office action mailed August 10, 2006*, page 3, first full paragraph.

However, as discussed previously, Fednyshyn focuses on reducing or eliminating outgassing without resorting to the use of ring-opening reactions. In this regard, Fednyshyn describes that aromatic compounds can be mixed with resin compositions to reduce outgassing. *See, e.g., Fednyshyn*, col. 2, line 10-13. Fednyshyn indicates that almost any resin composition "available to those of ordinary skill in the art" can be used. *See Fednyshyn*, col. 7, line 26-29. Fednyshyn also explicitly identifies that acrylate based polymers and methacrylate based polymers are "suitable examples." *See Fednyshyn*, col. 7, line 33-35.

As for suitable aromatic compounds, Fednyshyn identifies that any of a large number of different aromatic compounds will reduce or even eliminate outgassing. *See, e.g., Fednyshyn*, col. 5, line 52 - col. 6, line 21. Whatever aromatic compound is chosen must be able to act as a "radical [scavenger] or have the ability to form stabilizing (or stabilized) radicals." *See, e.g., Fednyshyn*, col. 4, line 66 - col. 5, line 2.

Thus, Fednyshyn describes that outgassing can be reduced or even avoided using aromatic compounds that scavenge or stabilize radicals without relying upon a ring-opening reaction. Indeed, Applicant submits that Fednyshyn's identification of an alternative mechanism to reducing or preventing outgassing militates against the obviousness of the proposed combination. In particular, one of ordinary skill would find no reason to form a lactone that is reactable to undergo a ring-opening reaction and form an open ring structure to switch a solubility of the photoresist in a developer without generating an organic species that can outgas in a vacuum environment, as recited in claim 1, when Fednyshyn describes that these measures are unnecessary.

It is this issue that leads to the second contention discussed above, namely, the contention that the Fednyshyn reference is "solely cited" for its teaching that styrenes are common co-monomers with maelic anhydrides, acrylates, and methacrylates, but "not for its complete polymer."

Applicant submits that this is manifestly improper. It is well-established that the full field of the invention must be considered in making an obviousness determination. *See, e.g.*, *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988) (stating "[i]n determining whether such a suggestion can fairly be gleaned from the prior art, the *full field of the invention must be considered*; for the person of ordinary skill is charged with knowledge of the entire body of technological literature, including that which might lead away from the claimed invention.") (emphasis added).

In the present case, there is no reason to believe that one of ordinary skill would rely upon some teachings of Fednyshyn while excluding others. Indeed, this is exactly the sort of hindsight-based reconstruction of the claimed subject matter that has never been recognized as a proper basis for an obviousness rejection.

As for the third contention, namely, that the Yoon reference teaches that any common co-monomers may be included in the Yoon polymers, the broad disclosures of Yoon and Fednyshyn militate in favor of the non-obviousness of the claimed subject matter. In this regard, Yoon describes hundreds, if not thousands of photoresists. Only a small fraction of these resists include a lactone bonded to the polymer backbone that has a tertiary carbon bonded to the lactone carbonyl oxygen, as recited in claim 1. Fednyshyn describes that a large number of different suitable aromatic compounds will eliminate outgassing in almost any resin composition available to those of ordinary skill in the art.

When one of ordinary skill is confronted with such encompassing disclosures, there is no reason to believe that the recited subject matter would have been obvious. Only a small fraction of Fednyshyn's aromatic compounds and polymers have a side chain bonded to a polymer backbone that comprises a styrene ring, and only a small fraction of Yoon's polymers include a lactone bonded to the polymer backbone that has a tertiary carbon bonded to the lactone carbonyl oxygen. Nevertheless, the obviousness rejection contends that picking and chosing isolated teachings from Yoon and Fednyshyn would have been obvious.

The present rejection is thus manifestly improper, both for picking separate and isolated teachings from Yoon and Fednyshyn and contending that some of the teachings of Yoon and Fednyshyn would be considered by those of ordinary skill, but others would be ignored. Applicant submits that this cannot suffice to establish obviousness under 35 U.S.C. § 103(a). Accordingly, applicant respectfully requests that the rejections of claim 1 and the claims dependent therefrom be withdrawn.

Claim 25 was rejected under 35 U.S.C. § 103(a) as obvious over Yoon and Fednyshyn.

Claim 25 relates to a method that includes radiating an area of a chemically amplified photoresist in a vacuum environment to generate an acid within the photoresist and catalyze a ring-opening reaction of a lactone that includes a tertiary carbon bonded to the lactone carbonyl oxygen and catalyzing a ring-opening reaction in the photoresist. The ring-opening reaction suffices to switch the solubility of the photoresist in a developer without the generation of molecules that outgas from the photoresist in the vacuum environment. The chemically amplified photoresist includes a side group bonded to the polymer backbone. The side group includes a styrene ring.

The rejection of claim 25 contends that it would have been obvious for one of ordinary skill to have combined Yoon and Fednyshyn to have arrived at the recited subject matter.

Applicant respectfully disagrees. As discussed above with regard to claim 1, the present rejection picks separate and isolated teachings from Yoon and Fednyshyn and asserts that a combination of these teachings would have been obvious to those of ordinary skill. Moreover, the rejection contends that some of the teachings of those references would be considered by those of ordinary skill, but others would be ignored.

This is manifestly improper and an obviousness rejection cannot be sustained on this basis. Accordingly, applicant respectfully requests that the rejections of claim 25 and the claims dependent therefrom be withdrawn.

Claim 33 was rejected under 35 U.S.C. § 103(a) as obvious over Yoon and Fednyshyn. Claim 33 relates to a photoresist that includes a polymer backbone, a lactone fused to the polymer backbone, and a styrene ring side chain bonded to the polymer backbone. The lactone comprises a tertiary carbon bonded to the lactone carbonyl oxygen. Sufficient lactone is fused to the polymer backbone so that a ring-opening reaction of the lactone to form an open ring structure suffices to switch a solubility of the photoresist in a developer.

The rejection of claim 33 contends that it would have been obvious for one of ordinary skill to have combined Yoon and Fednyshyn to have arrived at the recited subject matter.

Applicant respectfully disagrees. As discussed above with regard to claim 1, the present rejection picks separate and isolated teachings from Yoon and Fednyshyn and asserts that a combination of these teachings would have been obvious to those of ordinary skill. Moreover, the rejection contends that some of the teachings of those references would be considered by those of ordinary skill, but others would be ignored.

This is manifestly improper and an obviousness rejection cannot be sustained on this basis. Accordingly, applicant respectfully requests that the rejections of claim 33 and the claims dependent therefrom be withdrawn.

No fees are believed due at this time. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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